ALEX® Case Report No. 4

Rodica, 19y, from South-Eastern Europe

Clinical History

Atopic dermatitis was observed in early childhood. Back then, skin prick tests showed positive results for hen's egg and cow's milk. The patient grew out of both allergies.

As a young teenager rhino-conjunctivitis was observed. Blood- and skin tests revealed sensitizations to ragweed- and mugwort pollen.

Family History

Mother and one sibling are allergic to pollen.

Present situation (2018)

Now, certain fruits elicit mild to moderate symptoms when consumed fresh or processed. The symptoms include oral allergy syndrome, nausea and vomiting, as well as itchy hand palms & itchy soles of the feet.

An ALEX test was requested to analyse the pollen allergies for a possible AIT prescription and for risk assessment of the presumed fruit allergies.

ALEX Results*

Allergen Source	Allergen	Biochemical Designation	IgE Level [kU_A/L]
Birch	Bet v 2	Profilin	1.24
Date palm	Pho d 2	Profilin	1.89
Perennial ryegrass	Lol p 1	β-Expansin	2.84
Timothy grass	Phl p 1	β-Expansin	3.79
	Phl p 2	Expansin	1.57
	Phl p 12	Profilin	2.14
Ragweed	Amb a 1	Pectate lyase	0.89
	Amb a 4	Defensin-like protein	0.62
Mugwort	Art v 1	Defensin-like protein	0.78
	Art v 3	nsLTP	0.61
Ribwort	Pla l 1	Ole e 1-family	0.61
Apple	Mal d 3	nsLTP	0.60
Muskmelon	Cuc m Extract		1.37
Kiwi	Act d 10	nsLTP	0.99
Peach	Pru p 3	nsLTP	1.18
Hen's egg	Gal d 2	Ovalbumin	0.37
Latex	Hev b 8	Profilin	0.97

* For convenience extract results are not shown, if a corresponding component was positive.

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Interpretation

- The earlier results for grass-and weed pollen were confirmed by ALEX.
- The major allergens Lol p 1, Phl p 1&2 demonstrate a genuine grass pollen allergy – an AIT could be helpful.
- The minor and cross-reactive allergen Phl p 12 can explain the positivity for fruit extracts like muskmelon.
- Further profilins detected were Bet v 2 from birch pollen, Pho d 2 from date palm pollen and Hev b 8 from Latex. All of them showed no corresponding symptoms.
- Profilins usually cause no or mild symptoms. Many positive latex extract results can be attributed to a clinically silent Hev b 8 sensitizations.
- The major allergens of ragweed-, mugwort- and ribwort pollen: Amb a 1, Art v 1 and Pla l 1 confirm a genuine sensitization to the respective allergen sources – an AIT could be helpful.
- Amb 4, a minor allergen from mugwort, has a high amino acid homology to Art v 1 and therefore could be caused by a primary Art v 1 sensitization.
- An Amb a 4 sensitization without positive Amb a 1 can be interpreted as a cross-reactivity and an AIT would not be advised.
- Art v 3 from mugwort is a partially cross-reactive allergen and member of the nsLTP family.
- Further positive nsLTP results were found for apple (Mal d 3), Kiwi (Act d 10) and Pru p 3(Peach).
- nsLTP can cause mild to severe allergic symptoms, which is in concordance with the presented clinical history.
- nsLTPs are stable towards digestion and heat treatment.
- The sensitization to Gal d 2 from hen's egg seems to be an immunological remnant from childhood. No clinical reactions were observed to hen's egg since then.

Summary

- Rodicas skin test results were confirmed, and the responsible allergens were detected at the molecular level. The patient would be suitable for AIT against grass and various weed pollen.

- The profilin sensitization originates from Phl p 12 (Timothy grass). Antibodies directed against this molecule can cross-react with related allergens in various fruit species (e.g. melon, citrus et al). Profilins are not resistant to digestion or heat treatment and usually cause only mild symptoms.

- nsLTP's are stable towards digestion and heat treatment and can cause mild to severe symptoms. Avoidance is advised.